What is claimed is:

1. A method of inducing the formation of kidney epithelia which comprises contacting mesenchymal precursors, in the presence of a growth factor, with an amount of a purified gp130 receptor ligand effective to induce the formation of kidney epithelia.

2. The method of claim 1, wherein the gp130 receptor ligand is a leukemia inhibitory factor.

3. A method of inducing the differentiation of fetal tissue, fetal cells, or fetal or postnatal precursor or stem cells into kidney nephrons in a subject with diminished kidney function, which comprises administering to the subject, in the presence of a growth factor, an amount of a gp130 receptor ligand effective to induce differentiation of such fetal tissue, fetal cells, or fetal or postnatal precursor or stem cells into kidney nephrons.

4. The method of claim 3, wherein the fetal tissue, fetal cells, or fetal or postnatal precursor or stem cells are treated with a gp130 receptor ligand ex vivo, in the presence of a growth factor, and the so treated fetal tissue, fetal cells, or fetal or postnatal precursor or stem cells are then transplanted into the subject with diminished kidney function.

5. The method of claim 3, wherein the gp130 receptor ligand is a leukemia inhibitory factor.

6. A method of treating a subject suffering from kidney failure which comprises administering to the subject, in the presence of a growth factor, an amount of a gp130 receptor ligand effective to treat the subject's kidney failure.

7. The method of claim 6, wherein the gp130 receptor

ligand is a leukemia inhibitory factor.

8. A method of preserving a kidney for transplantation which comprises contacting the kidney, in the presence of a growth factor, with an amount of a gp130 receptor ligand effective to preserve the kidney.

9. The method of claim 8, wherein the gp130 receptor ligand is a leukemia inhibitory factor.

10. The method of claim 1, 4, or 8, wherein the effective amount of the gp130 receptor ligand is an amount from about 5 ng/ml to about 200 ng/ml.

11. The method of claim 3 or 6, wherein the effective amount of the gp130 receptor ligand is an amount from about 1 μg/kg to about 50 μg/kg of body weight.

12. The method of claim 1, 3, 6, or 8, wherein the gp130 receptor ligand is a cardiotrophin, an oncostatin M, a ciliary neuronotrophic factor, or an interleukin-6.

13. The method of claim 1, 3, 6, or 8, wherein the growth factor is one or more of a TGFα, a FGF-2, a FGF-9, a TIMP-1, or a TIMP-2.

14. The method of claim 1, 4, or 8, wherein the growth factor is TGFα, FGF-2, or FGF-9 and the effective amount of TGFα, FGF-2, or FGF-9 is an amount from about 1 ng/ml to about 100 ng/ml.

15. The method of claim 3 or 6, wherein the growth factor is TGFα, FGF-2, or FGF-9 and the effective amount of TGFα, FGF-2, or FGF-9 is an amount from about 0.1 μg/kg to about 25 μg/kg of body weight.

16. The method of claim 1, 4, or 8, wherein the growth factor is TIMP-1 or TIMP-2 and the effective amount of

TIMP-1 or TIMP-2 is an amount from about 200 ng/ml to about 2 μg/ml.

17. The method of claim 3 or 6, wherein the growth factor is TIMP-1 or TIMP-2 and the effective amount of TIMP-1 or TIMP-2 is an amount from about 25 μg/kg to about 500 μg/kg of body weight.

18. The method of any of claims 1, 3, 6, or 8, wherein the gp130 receptor ligand is a polypeptide comprising a sequence identical to a naturally occurring human gp130 receptor ligand.

19. The method of any of claims 2, 5, 7, or 9, wherein the leukemia inhibitory factor is a polypeptide comprising a sequence identical to a naturally occurring human leukemia inhibitory factor.

20. The method of any of claims 1, 3, 6, or 8, wherein the growth factor is a polypeptide comprising a sequence identical to a naturally occurring human growth factor.

21. A method of inducing the formation of kidney epithelia which consists essentially of contacting mesenchymal precursors, in the presence of a growth factor, with an amount of a gp130 receptor ligand effective to induce the formation of kidney epithelia.